

vessels is especially desired. Blank forms for meteorological observations, with instructions for taking the same, will be furnished upon application either by mail or in person to the Hydrographer, United States Hydrographic Office, Navy Department, Washington, D. C., or to any one of the branch offices.

The charts will be furnished free of charge to cooperating observers, irrespective of nationality.

The charts contemplated in the above notice will be gladly welcomed by meteorologists, who necessarily study the whole globe rather than any one small section. Of course they will at first be made up largely from the normal data already accessible, but after a few years the accumulated publications of current data will constitute a very important and convenient addition to our limited knowledge of the Southern Hemisphere. It is to be hoped that the whole Southern Hemisphere is to be included in the two charts entitled South Atlantic and South Pacific oceans. It certainly would be a great pity to omit the South Indian Ocean.

A DAILY WEATHER MAP FOR THE NORTHERN AND SOUTHERN HEMISPHERES.

In a recent letter from Sir John Eliot, Meteorological Reporter to the government of India and Director-General of Indian Observatories, he says:

Meteorology is a question of thermodynamics and aerodynamics. There are probably some general relations between sun spots and terrestrial magnetism and some of the broader and most general features of terrestrial meteorology. They can, however, only be of use as indications of large local variations of weather (such as are experienced in India) after we have investigated the problems from the hydrodynamical side, or as questions of variations of air movement depending upon variations of absorption of solar radiant energy, etc.

When I was in England recently, Sir Norman Lockyer, Mr. W. N. Shaw (the head of the Meteorological Office), and myself discussed the possibility of a daily weather report and chart of the British Empire. It is quite in the air at present, but I have already consulted the government of India and the present authorities fully sympathize and would be prepared to do their share. Perhaps if the United States and England joined hands in this, it might eventually lead to the world map which you suggest.

THE METEOROLOGICAL OBSERVATORY AT SAN FERNANDO, SPAIN.

A letter of October 15, 1903, announces that by royal decree of August 20, Captain Fuenoy de Azearte has been appointed director of the Marine Institute and Observatory at San Fernando, in the Province of Cadiz, Spain. This institution was established in 1753 by King Iorge Juan. It was then located at Cadiz, but was transferred to San Fernando at the beginning of the 19th century. It is at present conducted under the regulations laid down in 1873. It publishes a nautical almanac for the use of Spanish navigators, and a volume of astronomical, magnetic, and meteorological observations, and also examines the nautical instruments used by the Spanish Navy for the purpose of detecting errors.

EDUCATION OF METEOROLOGISTS.

The gradual development of meteorology has for two hundred years been due to the activity and faithfulness of innumerable observers throughout the world and it has not been supposed that the labor of reading instruments and making weather records required anything but ordinary intelligence, good habits, and perseverance on the part of the observers. Those who have tried to penetrate the laws of atmospheric phenomena generally found the problems too difficult and very few profound theories have, as yet, been accepted as satisfactory to the best students. At the present time, however, the so-called practical man is being very hard pushed in order to keep abreast with the progress that is be-

ing made by a new race of investigators who are applying to the atmosphere the best that is now known relative to all the laws of physics and mechanics. It will no longer do to say that the practical man is ahead of the theoretical or that the college graduate is inferior to one who is not a collegian. Whatever advance may be made in the practical business operations of the thirty or forty national weather bureaus now in existence; however much they may extend the telegraphic work, and the areas covered by the daily weather maps, or the accuracy and minuteness of the daily weather forecasts, yet, there will always be use for those who are delving deeper and searching further. There is a divine instinct that leads men to strive upward and forward in the realm of knowledge. We are confident that everything is governed by law and that these laws are not beyond our knowledge. Little by little we shall dissipate the ignorance around us; we shall unveil the arcana of the universe; we shall find the work of the observer confirming our theories; we shall honor those leaders of science whose fancies have not led them astray in their efforts to discover the laws of nature.

An article by Prof. Edwin G. Dexter, published not long since in the "Popular Science Monthly," shows very clearly that the high grade college graduates also attain a high grade in subsequent practical life in the world at large. He concludes by saying:

The statistical evidences that the high grade man maintains his status in after life, which are here presented, though open to all the criticisms of the statistical method are nevertheless in accord with our general belief of what should be. If the college course is a true preparation for life, it is but natural to expect that he who best fulfils the requirements of the former is best fitted for the latter. Were this not so we should pronounce the preparation a failure.

May we not add that if education is good for the business man it may also be good for the meteorological observer. Shall we not make better observers in proportion as we study meteorology more thoroughly and learn to appreciate all the fine points that have been brought out by centuries of records and studies? Shall we not make better climatologists by having regard to the rules that govern the legitimate methods of studying statistics, rules that are as rigid as the laws of chance or the play of roulette or cards at the gaming table? Shall we not make better meteorologists by familiarizing ourselves with the laws of physics that pervade the whole atmosphere. The winds and clouds, heat and cold, rain, storm, and drought can not vary, except in obedience to the laws of nature.

COOPERATION IN GOVERNMENT WORK IN SCIENCE.

In its issue of April 16, 1903, *Nature*, London, prints in full the resolutions recently promulgated by the government of India, with the purpose of so directing the energies of the various departments as to promote an effective cooperation and prevent useless duplication in scientific work.

Steps in this direction were taken six years ago, when the policy of the government in establishing departments of scientific research was clearly set forth and the desirability of coordinating the labors of the different departments was pointed out. The broadening and development of scientific work in pursuance of the policy then outlined has but served to emphasize the necessity of the cooperation suggested at that time.

The work of many members of the scientific staff covers fields in which experiments of a similar or cognate character are being independently conducted. Thus in chemistry we have several investigators following parallel lines of research; in economic botany there are two departments working independently of each other; in economic entomology there have been two specialists, each charged with investigations similar to character.

It is therefore proposed to appoint a board of scientific advisors, which will review and advise generally upon the work of the departments, and will endeavor, not only to effect such consolidation as may be expedient, but also to direct the sci-